Bruhath Bengaluru Mahanagara Palike

# QUALITY ASSURANCE/QUALITY CONTROL REPORT

Office of the Chief Engineer (Quality Assurance/Control) Annexure-05,
BBMP Head Office, Hudson circle Bengalore-001,
Ph.no:08022975541, E-mail ID:qualitycontrol.bbmp@gmail.com

# QUALITY ASSURANCE REPORT/QUALITY CONTROL REPORT

| SE/QA/PR/ 72 /2022-23, DATE: 17/3/23 | | |
|---|---|---|
| **Name of Work** | : | Improvements to roads, drains and other developmental works at Yelahanka old town, Maruthinagara, Sapthagiri Layout Gandinagara KHB colony, Nehru nagara, shivanahalli, PDMS APTS premise and surrounding areas in ward No 01 of Yelahanka Division under Amruth Nagarothan Grants. (PACKAGE No-01) Estimated Cost. 1000.00 Lakhs. |
| **Job Code** | : | 001-23-000001 |
| **Bill No.** | : | **2nd &Final Bill, Rs.2,24,59,168.00 (including GST)** |
| **Name of Agency** | : | **M/s SATHYA CONSTRUCTIONS (R.Satheesh)** |
| **Type of Test Performed** | : | Rebound Hammer test as per IS13311-(2)-1992 |
| **Materials on which Tests Was Performed** | : | 1. Cement Concrete Road (M30)<br>2. Precast cover slab (M20)<br>3. Kerb stone (M20)<br>4. RCC Drain Wall (M20) |
| **Officers present during inspection** | : | 1.Sri.Ramsanjeevaiah AEE- Yelahanka old town sub division<br>2. Sri C. Shridhar AEE-Quality Assurance |
| **Project Management Consultants** | : | **M/s Rudraprasad Consultants.** |
| **Observations** | : | ➢ NDT (Rebound hammer test) was conducted by Project Management Consultants at random locations in presence of AEE (Yelahanka old town sub division) along with AEE of QA division .<br>➢ The Rebound Hammer Test was conducted randomly on Cement Concrete Road (M30), Precast cover slab (M20), Kerb stone (M20), RCC Drain Wall (M20)are recorded by the PMC consultants.<br>➢ Vitrified Tiles & Granite stone slab test reports are obtained from Bangalore University is here by reproduced in table – 5&6.<br>➢ The readings of Rebound Hammer Test results are tabulated and analysis of test results done by PMC is here by furnished.<br>➢ The location wise test results are reproduced in the tables shown below. |
| **Test Locations** | : | Location 1: Down Bazar Road, 1st Cross (Opp Maheshwaramma temple)<br>Location 2: Down Bazar Road, 2nd Cross (opp Ramesh house)<br>Location 3: 7th cross Marutinagar (opp H.No.92)<br>Location 4: BSF Campus Road (Opposite SP office) |

16/3/23
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Table-01: Rebound Hammer Test Results for Location-1

| Sl. No. | Member | Rebound Hammer Number | Average reading | Compressive Strength (N/mm2) for 28 days | Impact Direction |
|---|---|---|---|---|---|
| Sample Tested Location at Down Bazar Road, 1st Cross (Opp Maheshwaramma temple) | | | | | |
| 1 | CC Road (M30) | 32 | 31.00 | 32.00 | Vertical down |
| 2 | | 30 | | | |
| 3 | | 30 | | | |
| 4 | | 32 | | | |
| 5 | | 32 | | | |
| 6 | | 32 | | | |

Table-02: Rebound Hammer Test Results for Location-2

| Sl. No. | Member | Rebound Hammer Number | Average reading | Compressive Strength (N/mm2) for 28 days | Impact Direction |
|---|---|---|---|---|---|
| Sample Tested Location at Down Bazar Road, 2nd Cross (opp Ramesh house) | | | | | |
| 1 | CC Road (M30) | 32 | 31.00 | 32.00 | Vertical down |
| 2 | | 30 | | | |
| 3 | | 30 | | | |
| 4 | | 32 | | | |
| 5 | | 32 | | | |
| 6 | | 32 | | | |

Table-03: Rebound Hammer Test Results for Location-3

| Sl. No. | Member | Rebound Hammer Number | Average reading | Compressive Strength (N/mm2) for 28 days | Impact Direction |
|---|---|---|---|---|---|
| Sample Tested Location at 7th cross Marutinagar (opp H.No.92) | | | | | |
| 1 | CC Road (M30) | 32 | 32.00 | 34.00 | Vertical down |
| 2 | | 30 | | | |
| 3 | | 34 | | | |
| 4 | | 30 | | | |
| 5 | | 32 | | | |
| 6 | | 32 | | | |

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**Table-04: Rebound Hammer Test Results for Location-4**

| Sl. No. | Member | Rebound Hammer Number | Average reading | Compressive Strength (N/mm2) for 28 days | Impact Direction |
|---|---|---|---|---|---|
| Sample Tested Location at BSF Campus Road (Opposite SP office) | | | | | |
| 1 | Kerb stone (M20) | 30 | 30.00 | 24.00 | Horizontal |
| 2 | | 28 | | | |
| 3 | | 30 | | | |
| 4 | | 30 | | | |
| 5 | | 30 | | | |
| 6 | | 30 | | | |
| 1 | Precast cover slab (M20) | 26 | 26.00 | 24.00 | Vertical down |
| 2 | | 28 | | | |
| 3 | | 26 | | | |
| 4 | | 26 | | | |
| 5 | | 26 | | | |
| 6 | | 26 | | | |
| 1 | RCC Drain wall (M20) | 28 | 29.00 | 23.00 | Horizontal |
| 2 | | 30 | | | |
| 3 | | 30 | | | |
| 4 | | 28 | | | |
| 5 | | 28 | | | |
| 6 | | 30 | | | |
| 1 | CC Road (M30) | 32 | 32.00 | 34.00 | Vertical down |
| 2 | | 34 | | | |
| 3 | | 30 | | | |
| 4 | | 32 | | | |
| 5 | | 32 | | | |
| 6 | | 32 | | | |

**Table-05: Test Report of Vitrified Tiles**

| Sample: Vitrified Tiles 600x600x12mm | | | |
|---|---|---|---|
| SL.NO | Details of test | Test results | Requirements as per Specifications |
| 1 | Deviation in Length and width | +/-0.175% | +/-0.6% |
| 2 | Deviation in Thickness | +/-1.5% | +/-5% |
| 3 | Straightness of Sides | +/-0.15% | +/-0.5% |
| 4 | Rectangularity | +/-0.2% | +/-0.6 |
| 5 | Surface Flatness | +/-0.25% | +/-0.5% |
| 6 | Surface quality | 98.0 | 95%, min |
| 7 | Water Absorption | 0.045% | Less than 0.5% |
| 8 | Scratch hardness of surface (Moh's scale) | +6.0 | >6.0 |
| 9 | Flexural strength (Avg MOR) | 42N/mm$^2$ | Not less than 35.0N/mm$^2$ |
| 10 | Breaking Strength | 1450N | Not less than 1300N |

**Table-06: Test Report for Granite stone Sample**

| SI NO | Test conducted | Test results | Requirments as per IS:14223,Part-1:1995, Table.1 | Reference |
|---|---|---|---|---|
| 1 | Dry Density | 2.628 g/cc | 2.60-2.68 | IS:14223(partI):1995 |
| 2 | Water Absorption | 0.34% | 0.50, max | |
| 3 | Specific Gravity | 2.75 | 2.75, min | IS9143-1979 |
| 4 | Moisture Content | 0.05% | 0.15,max | |
| 5 | Tensile Strength | 140.0 Kg/cm$^2$ | 90.0 Kg/cm$^2$,min | IS 13030-1991 |
| 6 | Moh's Hardness | 6.5 on a scale of 10 | 6-7 | IS 13365(partI)-1998 |

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**Conclusion:**

The file containing **2nd & final bill** has been submitted for the above work to QA department on 10.03.202 requesting for spot inspection. Engineers of QA/QC division have visited the work spot on 13.03.2023

During the inspection, engineer in charge of work informed that items found in the bill, have been executed by the contractor & documents were made available by PMC team for inspection.

PMC team was instructed to assess the strength of concrete used for Cement Concrete Road (M30), Precast cover slab (M20), Kerb stone (M20), RCC Drain Wall (M20). The Rebound hammer test were conducted by PMC in presence of engineer in charge of work.

From the test results furnished by PMC consultants, it is concluded that the results of the samples collected are in accordance with the standards/ specifications mention in the IRC codes. However, the results submitted by the PMC have been reproduced here with for further needful action. The results checked by QA/QC relates only for item tested in the particular location randomly.

Further, QA/QC directs the PMC and Engineer in-charge of the work that all materials used for the work shall be inspected, tested and accepted as per the relevant specifications before incorporation in the work. The frequencies and methods of sampling and testing materials, including those required for definite purpose and not covered by MORT&H specifications shall be in accordance to the relevant IRC or BIS or AASHTO/ASTM/BS standards in order of priority.

The concerned Engineer in charge of the work shall follow the direction issued by Chief Commissioner Letter number dated 01.08.2022 and 14.09.2022 and take necessary action as appropriate in accordance with the law.

Note: -

This report by QA/QC is pertaining to the work carried out in **2nd& final bill** only.

Safety precautions shall be taken at work spot to prevent any mishap, injuries or loss of life to general public and construction workers according to guidelines laid down in code of practices.

Engineer in charge of work shall display details of work, work code, cost of project, start and completion date, and information of Engineer in charge of work with contact numbers at work spot.

Engineer in charge of work and Agency shall ensure that if any damages or defects occur pertaining to the executed work within the Defect Liability period (DLP) as per agreement .The same shall be rectified immediately on top priority without fail.

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**Location 1:** Down Bazar Road, 1st Cross (Opp Maheshwaramma temple)

**Location 2:** Down Bazar Road, 2nd Cross (opp Ramesh house)

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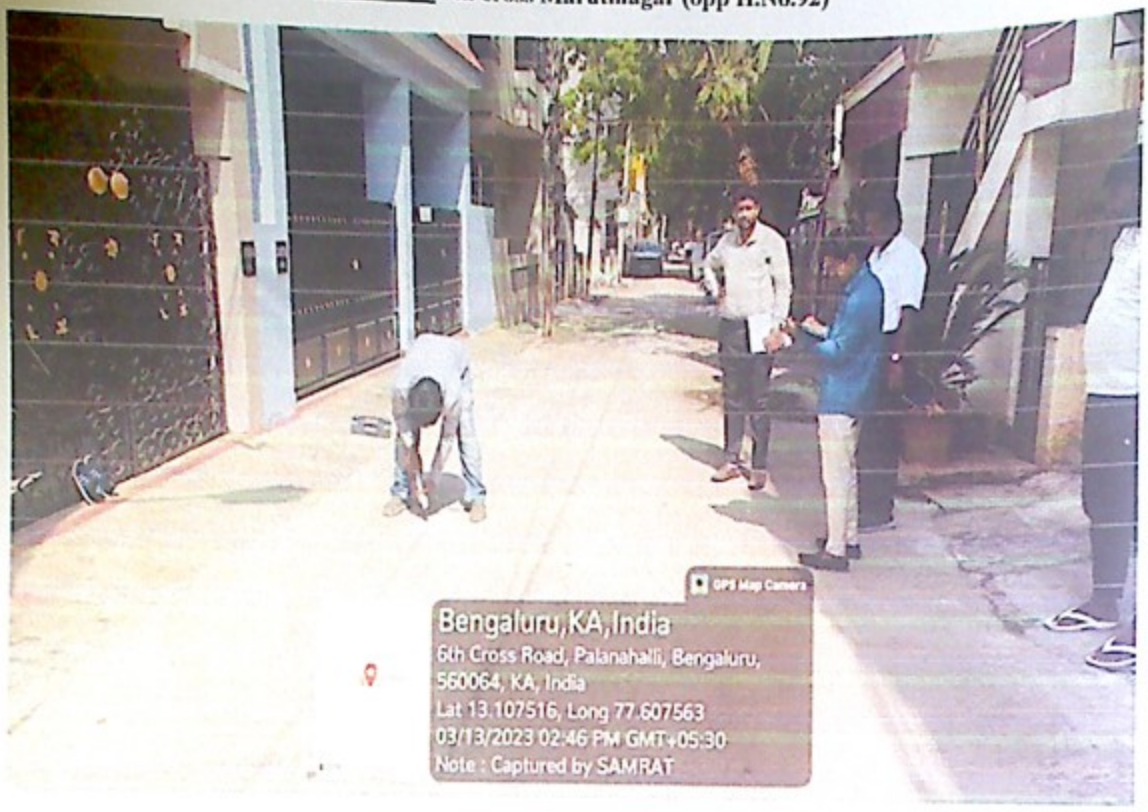
**Location 3:** 7th cross Marutinagar (opp H.No.92)




**Location 4:** BSF Campus Road (Opposite SP office)

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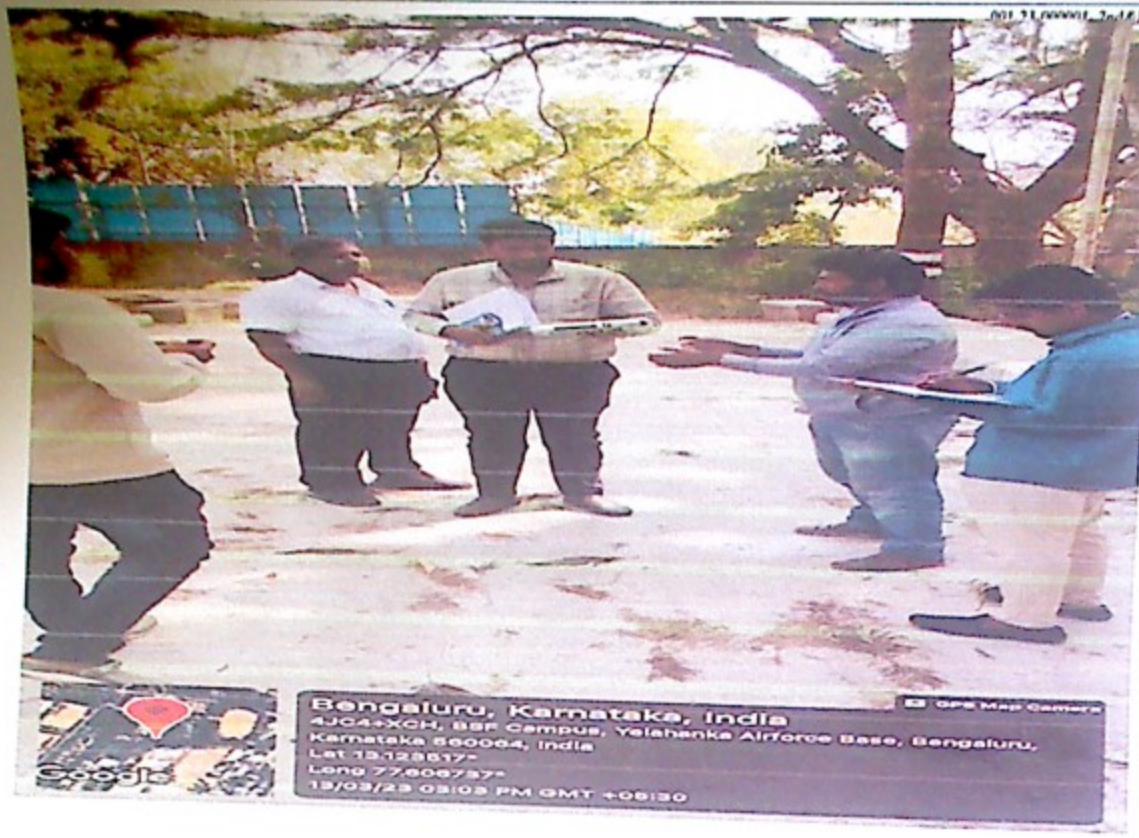


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